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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/835,115	04/13/2001	Michael J. Daneman	ONX-115B	4735

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EXAMINER
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CULBERT, ROBERTS P

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 10/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/835,115

Applicant(s)

DANEMAN ET AL.

Examiner

Roberts Culbert

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 19 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/19/03 has been entered.

### ***Response to Arguments***

Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection that follow.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 1, 2, and 5-7 are rejected under 35 U.S.C. 102(b) as being anticipated by International Patent Application Publication WO 99/36948 to Davis et al.**

Davis teaches a method for creating an electrically isolated electrode on a sidewall of a cavity in a base, comprising the steps of:

etching one or more trenches in a backside of the base, wherein the base is part of a starting material,

forming a layer of insulating material on one or more sidewalls of one or more of the trenches;

Art Unit: 1763

forming a conductive layer on the layer of insulating material on one or more sidewalls of one or more of the trenches,

depositing material on or removing material from a front side of the starting material that is different from the backside of the base,

and removing base material from a portion of the base bordered by the one or more trenches.

Regarding claim 2, Davis shows that the trenches are defined under a flap (See figure 8). If the structure shown in figure 8 is turned upside down, it is clear that the trenches are defined under a flap formed by the substrate (12).

Regarding claim 5, a layer of conducting material (110) is also deposited on the backside of the base. (See figure 8)

Regarding claim 6, the trench is formed using an anisotropic etch (page 15, lines 17-23 and page 16, lines 1-10).

Regarding claim 7, the base is a crystalline material such as single crystal silicon (page 14, line 6).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was

Art Unit: 1763

made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over International Patent Application Publication WO 99/36948 to Davis et al. as applied to claim 1 above, and in further view of U.S. Patent 6,074,890 to Yao et al.**

Davis et al. discloses the invention substantially as claimed, but does not use an etch stop layer to etch the trench in the base.

Yao et al. teaches the use of an etch-stop layer for etching a substrate (Col. 5, Lines 58-59). Furthermore, regarding the use of etch stop layers, it is notoriously old and well known in the silicon etching art that etch-stop layers will stop an etch at a predetermined level.

Since the purpose of the preliminary step in Davis et al. is to etch a trench to a specified level, and etch-stop layers are well-known in the art to facilitate this purpose, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply an etch-stop layer as shown in Yao et al. to the substrate prior to the preliminary etching step of Davis et al. to define the depth of the trench, in the well-known manner.

**Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over International Patent Application Publication WO 99/36948 to Davis et al. as applied to Claim 1 above, and further in view of U.S. Patent 6,121,552 to Brosnihan et al.**

As applied above, Davis et al. discloses the invention substantially as claimed, but does not fill the trench completely with the conducting layer.

Brosnihan et al. discloses a method for making an electromechanical device by forming an isolated electrode (Col.1 Lines 65-67) and (Col. 2 lines 1-6). Brosnihan et al. teaches covering the sidewall of a trench (18) with an insulating layer (64) (Col.6 Lines 26-31) and subsequently filling the trench with a conductor (66) (Col.6 Lines 38-42). Therefore, it would have been obvious to one of ordinary

Art Unit: 1763

skill in the art at the time the invention was made to completely fill the trench of Davis et al. as shown by Brosnihan et al. in order to form an isolated electrode.

**Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over International Patent Application Publication WO 99/36948 to Davis et al. as applied to claim 1 above, and further in view of U.S. Patent 5,960,255 to Bartha et al.**

As applied above, Davis et al. discloses the invention substantially as claimed, but does not teach the orientation of the crystal base and sidewall.

Bartha et al. teaches the use of a single crystal material that has a <110> surface orientation (Col.4 Lines 25-27). Bartha et al. shows that the vertical trenches are therefore parallel to the <111> planes (Col.4 Lines 36-38).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to etch the trench of Davis et al. using the crystal orientation shown by Bartha et al. in order to form a trench with straight and parallel sides that form a 90° angle with the base.


### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Roberts Culbert whose telephone number is (703) 305-7965. The examiner can normally be reached on Monday-Friday (7:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (703) 308-1633. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

R. Culbert

  
GREGORY MILLS  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700